Director, Defense Research and Engineering

DEPARTMENT OF DEFENSE

MODELING AND

SIMULATION (M&S)

DATA ADMINISTRATION

STRATEGIC PLAN (DASP)

FISCAL YEARS 1996 – 2003

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Defense Modeling and Simulation Office

EXECUTIVE SUMMARY

The Military Services, Joint Chiefs of Staff (JCS), Office of the Secretary of Defense (OSD), Combatant Commanders, and DoD Agencies are major users of modeling and simulation (M&S) for live exercises and for virtual and constructive simulations. Simulation environments span geographic regions; air, land, and naval forces; and command echelons, and are used in stand-alone or networked modes. The Chairman of the Joint Chiefs of Staff, General John Shalikashvili, has stated that the Services have not yet tapped the potential of using simulation. Given this vast expanse of applications and an acknowledged need for simulation, data quality and shareability are of paramount importance to users of M&S.

The Defense Modeling and Simulation Office (DMSO), delegated with the full mission and authority as the M&S Functional Data Administrator (FDAd) by the Director, Defense Research and Engineering (DDR&E), is developing and implementing the M&S Data Administration (DA) Program in accordance with the DoD M&S Master Plan (MSMP) and DoD Directives to manage these data resources more effectively in the M&S community. The M&S FDAd, together with the Data Technology Working Group (DTWG) and the M&S community, has put in place an infrastructure and is executing the MSMP. The M&S DA Program will enable data suppliers to provide the M&S community with cost-effective, timely, verified, validated, and certified data to promote reuse and sharing of data, interoperability of models and simulations, seamless interface between real-world command, control, communications, and intelligence (C3I) systems and M&S, and improved credibility of modeling and simulation results.

The M&S Data Administration Strategic Plan (DASP) for Fiscal Years (FY) 1996-2003 describes the M&S DA Program's mission, scope, implementation approach, goals and objectives, action plans, and resource requirements over an eight year period to achieve the DoD MSMP objectives. It also highlights major FY 1995 accomplishments.

The major accomplishments of the M&S DA Program during FY 1995, listed below, form the baseline for future phases of the MSMP. In its role as the M&S FDAd, DMSO:

- Established the M&S Data Administration Program and developed close coordination with the Component M&S offices through the DTWG to provide data administration support to the M&S community.

- Through the DTWG, identified key data issues being addressed in the data parts of the MSMP and supporting Investment Plan that guide DMSO's short-term and long-term DA initiatives.

- Nominated approximately 3300 data elements to DoD for standardization.

- Developed the Distributed Interactive Simulation (DIS) data dictionary (DD).

- Developed the Reverse Engineering for Data Integration and Sharing Methodology for migrating legacy databases into DoD standards.

- Developed an interim version of the distributed M&S Resource Repositories (MSRR) providing: M&S directories and catalogs; data standardization resources; and tools for browsing and accessing, linking across resources, security, and configuration management.

- Developing an authoritative data sources (ADS) catalog and making it accessible through the MSRR.

- Supported the development of data verification, validation, and certification (VV&C) guidelines to support data users and providers.

- Developed a platform-specific Data Quality Engineering (DQE) tool to check data quality.

- Provided M&S DA services for a pilot study in modeling complex data, submitting and reviewing candidate standard data elements to the DoD Data Administrator (DAd) for approval, training users, and facilitating development of shared databases and reusable data.

- Presented papers at the Military Operations Research Society (MORS), Armed Forces Communications-Electronics Association (AFCEA), Institute of Electrical and Electronics Engineers, Inc. (IEEE), and International Test and Evaluation Association (ITEA) conferences, Distributed Interactive Simulation (DIS) workshops, Component M&S Data Base Conferences, and M&S Industry Days.

Major emphases of the M&S 1996-2003 DASP are listed below:

- In accordance with the DoD DA policies and goals and the MSMP, develop a data technical framework and extend the M&S infrastructure to support the needs of M&S developers and end users.

- Develop data standards to support common representations of data in M&S and make them accessible on the MSRR.

- Prototype data interchange formats (DIFs) for DIS++, Synthetic Environment Data Representation and Interchange Specification (SEDRIS), Conceptual Models of the Mission Space (CMMS), the High Level Architecture (HLA) Object Model Templates (OMTs), and other M&S initiatives.

- Develop and test data VV&C guidelines with nominated candidate programs before submittal for formal DoD promulgation.

- Provide the M&S community on-line directories to authoritative data sources, databases, models and simulations to facilitate reuse and sharing.

- Develop a cross-platform DQE tool to check data quality.

- Develop tools to provide quality profiles on the MSRR.

- Define specific M&S data security requirements for access across repositories.

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GLOSSARY

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BIBLIOGRAPHY

A bibliography of sources used in the Plan is listed in Appendix D.

1 PROFILE

1.1 Organization

Modeling and Simulation (M&S) Functional Data Administrator (FDAd)

In November 1993, the Under Secretary of Defense for Acquisition and Technology USD(A&T) approved the Director of Defense Research and Engineering (DDR&E) as the designated FDAd for M&S (Reference 1). Subsequently, DDR&E delegated the FDAd mission and authority to the Defense Modeling and Simulation Office (DMSO) (Reference 2). The M&S Principal Staff Assistant (PSA) and the points of contact identified in the memorandum are as follows:

PSA
Name:	Dr. Anita K. Jones, Director
Organization:	Defense Research and Engineering
Phone Number:	(703) 697-5776
Fax Number:	(703) 693-7167
Electronic Mail Address:	jonesak@acq.osd.mil

M&S FDAd
Name:	CAPT James W. Hollenbach, Director
Organization:	Defense Modeling and Simulation Office
Phone Number:	(703) 998-0660
Fax Number:	(703) 998-0667
Electronic Mail Address:	jwh@dmso.mil

M&S FDAd Point of Contact (Reference 3)
Name:	Dr. Chien Huo, Associate Director
Organization:	Defense Modeling and Simulation Office
Phone Number:	(703) 998-0660
Fax Number:	(703) 998-0667
Electronic Mail Address:	msfdad@msis.dmso.mil

1.2 Data Administration Overview and Implementation Approach

1.2.1 DMSO Overview

DMSO was established in June 1991 to serve as a full-time focal point for information concerning DoD M&S activities and to promulgate M&S policy, initiatives, and guidance to promote cooperation among DoD components to maximize efficiency and effectiveness. Its data administration activities support the vision, goals, and strategic direction of DoD Data Administration.

The DoD M&S Master Plan (MSMP) (Reference 4) provides a comprehensive framework for planning, programming and budgeting of M&S projects, programs, and activities; and assigns responsibilities for implementation. The MSMP begins with the DoD Executive Council for Modeling and Simulation's (EXCIMS) Vision for M&S and describes how M&S can substantially
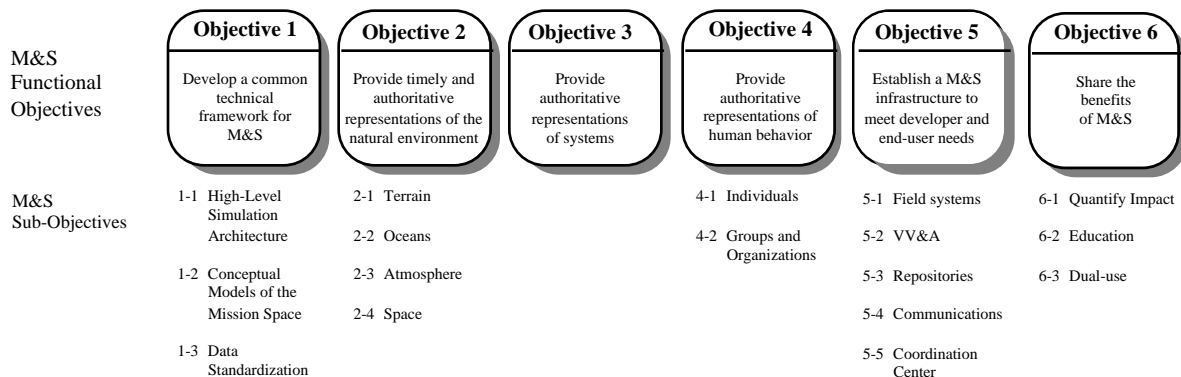
improve capabilities and decision making in each of the four pillars of military capability: (1) readiness, (2) modernization, (3) force structure, and (4) sustainability.

The DoD M&S Vision, adopted by the EXCIMS, alludes to the need for standards that will drive data and database interoperability:

> "Defense modeling and simulation will provide available, operationally valid environments for use by DoD Components...from *affordable, reusable components interoperating through an open systems architecture."*

The MSMP then examines a baseline assessment to identify shortfalls that must be corrected, presents six activities necessary to realize the M&S Vision and documents key issues, actions, and responsibilities.. Figure 1-1 illustrates how DoD Data Administration (DA) goals from DoD Directive 8320.1-M and the DoD DA Strategic Planning Guidance (Reference 5) provide an enabling infrastructure to support each of the six MSMP functional objectives.

DoD M&S Master Plan Objectives

M&S Functional Objectives	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	Develop a common technical framework for M&S	Provide timely and authoritative representations of the natural environment	Provide authoritative representations of systems	Provide authoritative representations of human behavior	Establish a M&S infrastructure to meet developer and end-user needs	Share the benefits of M&S
M&S Sub-Objectives	1-1 High-Level Simulation Architecture	2-1 Terrain		4-1 Individuals	5-1 Field systems	6-1 Quantify Impact
	1-2 Conceptual Models of the Mission Space	2-2 Oceans 2-3 Atmosphere		4-2 Groups and Organizations	5-2 VV&A 5-3 Repositories	6-2 Education 6-3 Dual-use
	1-3 Data Standardization	2-4 Space			5-4 Communications 5-5 Coordination Center	

DoD DA Goals

	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
1. Operational Central Repository	Moderate	Strong	Strong	Strong	Strong	Strong
2. Standardize data	Strong	Strong	Strong	Strong	Strong	Strong
3. Use Common Procedures & Tools	Strong	Strong	Strong	Strong	Strong	Strong
4. Data Quality/Security	Moderate	Strong	Strong	Strong	Strong	Moderate
5. Education & Training					Moderate	Strong
6. Data Administration Infrastructure	Strong				Strong	Moderate

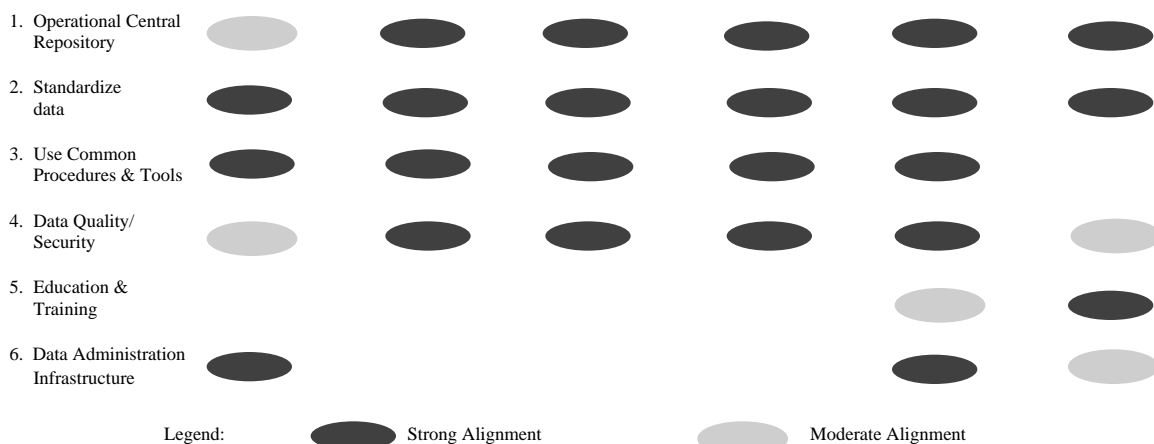Legend: ⬛ Strong Alignment   ⬤ Moderate Alignment

Figure 1-1. MSMP Objectives Support DoD DA Goals

M&S functional data administration promotes the development of DoD-wide data standards and is a key activity in helping to achieve the MSMP objectives. To be effective, M&S data administration must support the three M&S functional areas: (1) training; (2) analysis; and, (3) acquisition. M&S functional data administration initiatives encourage information sharing, investments in common technologies, and the formulation of common standards for simulation development and for interoperability across these functional areas.

1.2.2 Scope

The Plan applies to the Office of the Secretary of Defense (OSD), the Military Departments, the Chairman of the Joint Chiefs of Staff, the Unified Combatant Commands, the Inspector General of the DoD, the Defense Agencies, and the DoD Field Activities (hereafter referred to collectively as "DoD Components"). The scope encompasses the life cycle of M&S data: modeling data requirements; standardizing data elements; and collecting, validating, storing, and distributing data in a secure environment. The scope of the M&S Data Administration Strategic Plan (DASP) includes comprehensive, long term (6-8 years), mid-term (3-5 years), and short-term (1-2 years) direction to guide accomplishments that help achieve the MSMP objectives consistent with DoD DA goals.

1.2.3 M&S DA Mission and Strategic Objectives

The mission of the M&S DA Program is to enable data suppliers to provide the M&S community with cost-effective, timely, and certified data to promote reuse and sharing of data, interoperability of models and simulations within themselves and with the warfighter's command, control, communications, computers, and intelligence (C4I) systems, and improved credibility of modeling and simulation results.

The strategic objective of the M&S data standardization program is to:

- Establish, promulgate, and oversee policies, procedures and methodologies for M&S data requirements; data standards; data verification, validation, and certification (VV&C); authoritative data sources (ADS), and data security to provide quality data as common representations of the natural environment, systems, and human behavior.

The M&S FDAd will coordinate efforts to help achieve an M&S framework and infrastructure by concentrating on data necessary for representations of the natural environment, systems, and human behavior. The M&S FDAd:

- Directs data modeling projects to capture data requirements, develop common M&S data structures, and develop standard data elements;

- Works with data users and data producers to identify ADS and to standardize data;

- Ensures the on-going assessment and improvement of data quality; and

- Supports data security.

A distributed resource repository system will serve as the primary infrastructure for coordination and will store these information resources for standardization and reuse.

1.2.4 Implementation Approach

1.2.4.1 Customers

In addition to the DoD planning guidance and DA goals, the M&S implementation approach will:

- Support MSMP objectives.

- Directly address the special needs of data customers within the M&S community

    — Simulation developers (e.g., Joint Simulation System (JSIMS), Joint Warfare System (JWARS), and Synthetic Theater of War 1997 (STOW-97).

    — Simulation users (e.g., exercise planners, analysts/study directors, and operators).

- Promote coordination with functional areas of Command, Control, and Communications (C3) and Intelligence in support of warfighter' needs.

DoD leadership has encouraged the C4I and M&S communities to work toward a common system infrastructure. In February 1994, Gen. Shalikashvili, Chairman, The Joint Chiefs of Staff, stated we should make advanced simulations available to planners and operators worldwide over their C4I systems to address critical issues. In October 1994, the Defense Science Board Task Force on Information Architecture for the Battlefield recommended DoD capabilities for exercises, wargames, models and simulations in C4I be combined and expanded to enable operation from the same seat. The message is clear; models and simulations should not be stand-alone systems.

The M&S FDAd will continue to collaborate with and sponsor mutually beneficial initiatives with the C3 and Intelligence FDAds. To this end, the M&S FDAd will promote interoperability through the development of a reuseable set of technical tools to support seamless interfaces between C4I systems and simulations through the Modular Reconfigurable C4I Interface (MRCI). In addition, by 1998, the M&S infrastructure will provide distributed repositories that the entire community can use to access resources for reuse in models and simulations and real-world C4I systems

1.2.4.2 Requirements

M&S customers require:

- Availability of a common data structure to support the interchange of reference, instance, runtime and post runtime data. Where feasible, standard data from the DoD Repository (DoDR) will be used. Where not feasible to standardize all needed datasets, interfaces will be developed which will be considered for future standardization.

- Timely, complete databases from ADS including the ability to rapidly generate instance data to populate models and simulations.

- Assurance of quality data e.g., datasets which have undergone a VV&C process.

1.2.4.3 Issues

- Very few data standards are available today to support M&S users.. The process for establishing those standards is slow and results in little reuse. The need to establish data standards for scientific and technical complex data (e.g., probability of hit/kill, images, road networks) is a high priority in the M&S community because current DoD DA guidance addresses only atomic data and not complex data. Complex data has been difficult to model using the techniques that have been successfully applied to atomic data.

- ADS have not been completely identified. It currently takes a long time to generate data sets for M&S use and the current datasets are often incomplete requiring additional data build. In addition, most of the datasets are difficult to access and the data often required subject matter expert assistance to understand.

- There is no common definition of what constitutes data quality. There are few and limited tools to support checking for data quality and procedures for VV&C of data are not uniformly applied.

- Data security to facilitate data sharing is a high priority for the M&S community. Data centers are being formed with larger aggregated databases and very large exercises will be conducted using aggregated data under various protocols, e.g., Distributed Interactive Simulation (DIS), Aggregate Level Simulation Protocol (ALSP). Other security issues which need to be addressed are data exchange, access, protection of sources in downgrading data, and security labeling.

- Information about models and simulations and the databases needed to support them are often hard to identify and obtain. An open, distributed repository system must provide ready and easy accessibility of M&S resources to all interested M&S and C4I users.

1.2.4.4 Strategy

The overall M&S DA strategy includes:

- Obtain and disseminate available data standards.

- Develop M&S community-wide data structures to meet critical data needs and nominate for standardization.

- Identify existing and/or support development of interfaces for data exchange among prioritized M&S sources where standards are not feasible.

- Provide Component-approved ADS with descriptions.

- Ensure capability to rapidly order/generate/translate scenario reference and instance data for M&S use and identify data voids.

- Provide clear definitions and instructions for VV&C.

- Provide tools to improve data quality efforts.

- Provide operational support to the M&S data community through the M&S FDAd support organization shown in Figure 1.2.

1.2.4.5   Supporting Infrastructure

Figure 1-2 depicts the M&S DA technical support infrastructure, the Data Technology Working Group (DTWG), and its relationship with the M&S community and other DA organizations.
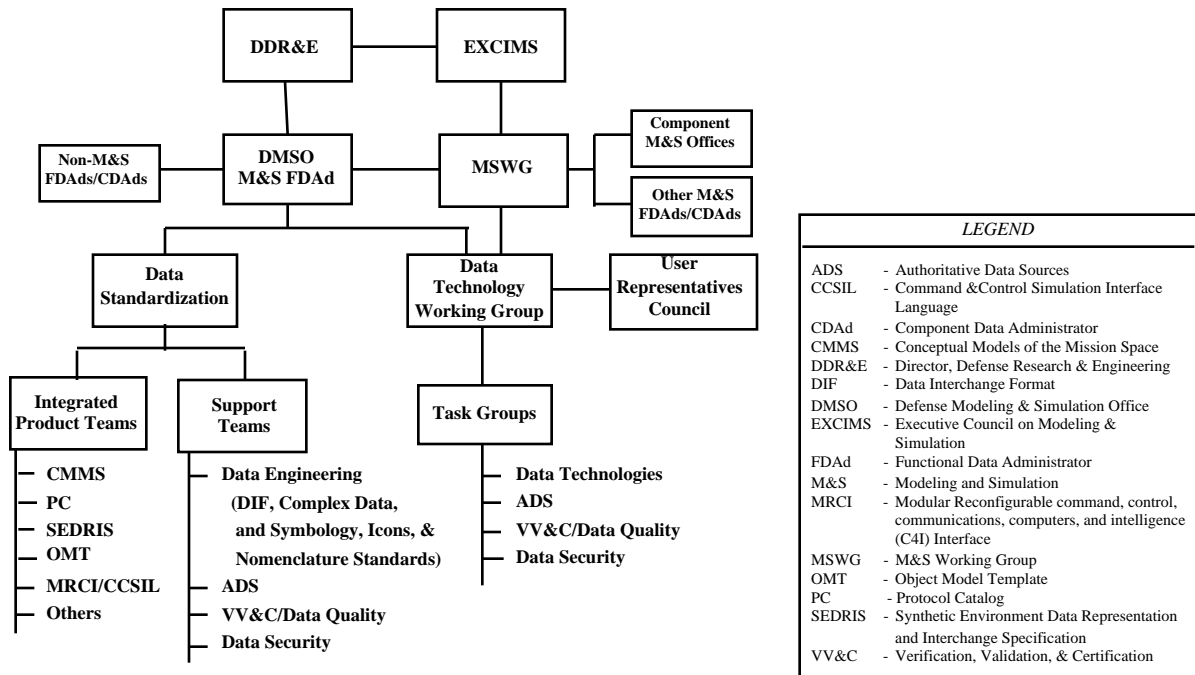
Figure 1-2. M&S DA Technical Support Structure

The DTWG was formerly the Data and Repositories Technology Working Group (DRTWG). The DRTWG focused on both data standardization and resource repositories. In FY95, the M&S Resource Repository (MSRR) transitioned from "development" to "implementation and execution" which no longer needed the guiding efforts of the DRTWG. The DTWG was reformatted and the MSRR is under a separate, focused management effort.

Within the DTWG organizational structure, M&S DASP Action Plans are implemented by combined government and contractor teams. The M&S FDAd manages these efforts assisted by chairs of the DTWG and Task Groups (TGs). Through consensus building, these groups define requirements, identify issues, and develop recommendations for implementation. As a result, the M&S FDAd gains a close working relationship with DTWG members who have functional and technical backgrounds to: (1) ensure that DA policy, procedures, and standards are being implemented effectively; and (2) develop standard data products for current and planned simulation applications.

1.2.4.6   Deliverables

The M&S FDAd is implementing the M&S DA strategy incrementally and concurrently within the M&S community through the following steps:

1.2.4.6.1 Common M&S Data Structures

- Direct access to existing DoD data standards and applicable data models on the MSRR.

- Support to simulation developers and data suppliers for data standardization. Operational services for modeling atomic and complex data, developing data standards, and reviewing and submitting M&S functional data model packages to the DoD DAd for approval.

- Data Interchange Formats (DIFs) to support M&S data users in areas where standard data may not be available or feasible.

- Extensions to standards to accommodate complex data, object oriented use of data, and standardized symbology, Icons, and Nomenclature

- Promulgate M&S DA policies, procedures, and standards in accordance with DoD Directives for use by the M&S community to promote data sharing and interoperability.

1.2.4.6.2 ADS

- Identify Component-approved ADS with taxonomy and descriptions on the MSRR.

- Selected number of "write" interfaces to support exchange of data between 'non-standard' data systems.

- Establish tools to provide rapid access for ordering and obtaining authoritative data for initiation and execution of models and simulations.

1.2.4.6.3 Quality Data

- Initial draft of VV&C guidelines for DoD promulgation.

- Exportable platform/database independent Data Quality Engineering (DQE) tool.

1.2.4.6.4 M&S Community Support

- Operation of the M&S DA support organization and coordination of M&S DA activities with Components through the organization shown in Figure 1-3.

- Operational M&S DA services to the M&S community.

- Data user training and support for development of shared databases and reusable data in stand-alone and networked environments, i.e., MSRR.

1.2.5 Goals and Objectives Summary

Action plans for M&S are summarized below. Each action plan supports the strategic objectives identified in the M&S Master Plan. Strong leadership and an effective infrastructure are critical to implementing these action plans successfully. DMSO is implementing the M&S DA Program as described in paragraph 1.2.4. For more details, refer to Section 2, Action Plans.

1.2.5.1   Goal 1: Operational Central Repository

DoD guidance for Goal 1 includes: Use the Defense Data Dictionary System (DDDS) and the Personal Computer Access Tool (PCAT).

To support this goal, M&S will:

- Promote registering M&S users of DoD and M&S repositories to facilitate DoD data standardization and encourage data sharing and reusability.

- Distribute and utilize the PCAT within the M&S community for browsing, accessing, and submitting functional data model proposal packages.

- Develop tools to permit easy access to and retrieval for reuse of the Command and Control (C2) Core and DoD Data Models (DDM) on the MSRR.

- Assist in refining the requirements for DoD's next generation data repository with members of the M&S community and the DoDR Steering Committee (DoDR SC) and participate as a DoDR beta test site for new repository being fielded by DoD.

1.2.5.2   Goal 2: Standard Data

DoD guidance for Goal 2 includes: develop data standards, perform data modeling, incorporate external standards, develop shared database(s), perform data mapping and migration, support migration systems, support new start systems, and support business process reengineering (BPR).

To support this goal, M&S will:

- Develop, implement, and continually improve the M&S data standardization process including processes for packaging and submitting data model proposal packages to DoD for standardization.

- Coordinate functional and technical reviews of proposal packages by appropriate M&S personnel.

- Develop, coordinate, and submit data model proposal packages to DoD DA for integration with the DDM.

- Coordinate M&S data modeling requirements with C3 and Intelligence FDAds.

- Perform pilot studies with Integration Definition for Information Modeling (IDEF1X) (version 1995) (IDEF1X$_{95}$) for M&S complex data representation and object oriented modeling techniques.

- Develop extensions to DoD data standards to handle symbology, icons, nomenclature, and incorporate into DoDD 8320.1.

- Establish authoritative data representations of high priority M&S subject areas (e.g., natural environmental representations (terrain, oceans, atmosphere and space); systems representations; and human behavior representations (individuals and groups).

- Identify and support data modeling and standardization on existing DIFs and identify critical areas where DIFs are needed.

- Develop DIFs for prioritized programs such as Conceptual Models of the Mission Space (CMMS) and High Level Architecture (HLA) Object Model Templates (OMTs).

1.2.5.3   Goal 3: Use of Common Procedures and Tools

DoD guidance for Goal 3 includes: implement methodologies and techniques, develop tools, and perform technology transition.

To support this goal, M&S will:

- Promote the use of the Subject Area Information (SAI) Reverse Engineering for Data Integration and Sharing Methodology for developing data models and standardizing data elements from legacy systems.

- Develop tools to allow users to easily identify, access, order, and automatically retrieve ADS databases on the MSRR.

- Make the U.S. Central Command (CENTCOM) DQE tool portable across multiple platforms and database management systems and provide to the DoD DA community.

- Develop tools to describe data quality and provide quality profiles on the MSRR.

- Investigate object oriented techniques and other emerging technologies for extensibility into IDEF1X methodology/procedures.

1.2.5.4   Goal 4: Quality Data and Data Security

DoD guidance for Goal 4 includes: assure data quality, assure data security, and maintain configuration management.

To support this goal, M&S will:

- Establish nominative procedures for VV&C, perform pilot studies to verify/refine the procedures, and make data quality histories available on the MSRR.

- Identify Component-approved ADS and populate the MSRR with source identification, location, and description.

- Define data security requirements for the MSRR.

- Document M&S data standardization activities on the MSRR.

- Develop Data Dictionaries (DDs) for next-generation DIS (DIS++), Synthetic Environment Data Representation and Interchange Specification (SEDRIS), CMMS, and HLA OMTs.

1.2.5.5 Goal 5: Education, Training, and Consultation Services

DoD guidance for Goal 5 includes: train personnel, develop courses, and provide DA consultation.

To support this goal, M&S will:

- Promote user awareness and sharing of information across the M&S, DoD, academia, and contractor communities.

- Identify training requirements and provide training to interested data administration personnel and schedule them in the M&S DA master schedule.

- Develop and implement a training plan.

- Update and advertise the reverse engineering course provided by the Electronic Proving Ground (EPG) Joint DataBase Elements (JDBE) Program.

- Provide consultation services and schedule them in the M&S DA master schedule.

1.2.5.6 Goal 6: Effective Infrastructure

DoD guidance for Goal 6 includes: implement policy and procedures, establish performance metrics, perform coordination, and perform promotional and information dissemination activities.

To support this goal, M&S will:

- Promulgate Instruction on M&S DA policy and procedures as a supplement to DoDD 5000.59.

- Provide Manual on Reverse Engineering for Data Integration and Sharing Methodology to the Defense Information Systems Agency (DISA) for promulgation as a supplement to DoD 8320.1-M.

- Draft the Manual on Data Quality Methodology for DISA promulgation as a supplement to DoD 8320.1-M.

- Establish metrics for evaluating the performance of DA program.

- Maintain a master schedule for M&S DA activities and conduct M&S coordination meetings as required.

1.3 Major FY95 Accomplishments

Goal 1   Operational Central Repository

- Worked with the DoD DAd to prioritize changes to be implemented in DDDS releases and with the DoDR SC to identify M&S community requirements for DDDS.

- Registered additional users for the DDDS and PCAT through the DTWG.

Goal 2   Standard Data

- Performed cross-functional review of 56 DoD data standardization packages

- Developed data models for Universal Threat System for Simulators (UTSS), Electromagnetic Spectrum (Antenna, Radio Frequency (RF) Signal, Receiver, and Transmitter Views), Conventional Forces Database (CFDB), Master Simulation Data System (MSDS), and M&S Directories.

- Submitted 584 Prime Words and 2725 data elements to DoD for standardization.

- Added Electromagnetic Environments data bucket to DDM.

- Developing new requirements to DoD DAd for complex data not addressed in DoD 8320.1-M-1. (Reference 6)

Goal 3   Use of Common Procedures and Tools

- Developed a logical data model for the M&S directories that for the first time will allow data to be collected which characterizes and identifies sources and locations of models, simulations, databases, and authoritative data sources.

- Developed and validated the Reverse Engineering for Data Integration and Sharing Methodology with SAI models for several simulation systems and published a draft manual for migrating legacy M&S databases (Reference 7).

- Developed a DQE tool to check accuracy of source data files in the CENTCOM CFDB/MSDS. Began development of a version for use on other data files.

- Developed an interim version of the distributed MSRR providing: M&S directories and catalogs; data standardization resources (e.g., process and data models, data dictionaries); and tools for browsing and accessing, linking across resources, security, and configuration management.

Goal 4   Quality Data and Data Security

- Conducted studies on eleven cases nominated by OSD, Services, and Agencies to determine VV&C requirements. Developed and published VV&C definitions and draft VV&C guidelines. Continued coordination of VV&C with ongoing work on verification, validation, and accreditation (VV&A) of models and simulations.

- Developed and published a taxonomy of ADS on the MSRR. Defining and identifying ADS, data centers, and data center roles and responsibilities.

- Developing security policies and procedures for administration, release, use, and modification of M&S data, simulations, and models.

- Developed DD based on the DIS standard version 2.0.4 Protocol Data Unit (PDU).

Goal 5   Education, Training, and Consultation Services

- Developed a formal training course on the reverse engineering methodology for producing data models from legacy systems using SAI methodology and trained over 100 M&S community personnel.

- Convened DRTWG semi-annually as an outreach program for members of the M&S community to discuss: functional and Component M&S activities, DA initiatives, data issues such as data modeling, heterogeneous databases, VV&C, data security, and data standards, and supporting technologies such as information repositories and automated tools. Numerous working sessions were held by the TGs and subgroups.

- Provided data modeling training and support to CENTCOM, the Navy's UTSS Program, Modeling and Simulation Information Management Project (MSIM), and Naval Warfare Tactical Database (NWTDB) Program; and the Army's Space and Strategic Defense Command (SSDC).

- Formed and chaired the DIS Data Standards and Repositories (DSR) Special Interest Group (SIG) to establish a forum for discussion and resolution of important issues concerning obtaining and reusing data during DIS exercises.

Goal 6   Effective Infrastructure

- Presented papers at the Military Operations Research Society (MORS), Armed Forces Communications-Electronics Association (AFCEA), Institute of Electrical and Electronics Engineers, Inc. (IEEE), and International Test and Evaluation Association (ITEA) conferences, DIS workshops, Component M&S Data Base Conferences, and M&S Industry Days.

- Extended the M&S DA infrastructure to include FDAd support organizations, Component M&S offices, DTWG TGs and subgroups, and other FDAds and Component Data Administrators (CDAds). Operated DRTWG task groups and subgroups to address: data standards and complex data standardization; data VV&C; ADS; data security requirements; and resource repositories.

2 ACTION PLANS

Note: **Section 2.7** addresses resource requirements for all M&S data administration (DA) activities.

2.1 GOAL 1: Operational Central Repository

The Modeling and Simulation (M&S) Functional Data Administrator (FDAd) and the M&S community are actively using the Defense Data Dictionary System (DDDS) and the Personal Computer Access Tool (PCAT) to register, maintain, and review information on the use of standard data and management support data.

2.1.1   Objectives

2.1.1.1   Use Repository

The M&S FDAd and the M&S community are actively populating and using the DDDS and the Modeling and Simulation Resource Repository (MSRR) for collection, maintenance, access, retrieval, and reuse of standard data products. The M&S FDAd represents the functional needs of the M&S community to the DoD Data Administrator (DAd). The M&S FDAd supports the ongoing DoD effort to field and evaluate the emerging DoD Repository (DoDR).

- Promote registering M&S users of DoD and M&S repositories to facilitate DoD data standardization and encourage data sharing and reusability. (Continuing)

- Distribute and utilize the PCAT front end within the M&S community for browsing, accessing, and submitting functional data model proposal packages. (Continuing)

- Develop tools to permit easy access to and retrieval for reuse of the Command and Control (C2) Core and DoD Data Model (DDM) on the MSRR. (FY96)

- Assist in refining the requirements for DoD's next generation data repository with members of the M&S community and the DoDR Steering Committee (DoDR SC). M&S requirements include a repository metamodel, directories, support for complex data, symbology, icons, and nomenclature, data verification, validation, and certification (VV&C) and security, Authoritative Data Sources (ADS), configuration management, data collection and distribution (e.g., data centers), and support for the M&S FDAd and DoD data standardization process. (Continuing)

- Participate as a DoDR beta test site for new repository being fielded by DoD. (FY96)

2.1.2   Milestones

OBJECTIVES	REFERENCE #	ACTIONS	PROJECTED START/ COMPLETION DATES
Use repository	2.1.1.1	1) Register users for DDDS/MSRR 2) Distribute PCAT 3) Develop tools to view/reuse C2 Core Data Model & DDM on MSRR 4) Develop and submit revised M&S requirements to DoDR SC 5) Become a beta test site	1) Continuing 2) Continuing 3) FY96 4) Continuing 5) FY96

2.1.3   Lessons Learned

As presently constituted, the DDDS exhibits some shortcomings. It lacks provisions for easy access to data and process models. Its access method is neither user friendly nor timely. It cannot handle complex data. It does not manage standard symbols, icons, and nomenclature. It does not provide easy linking of DDDS data elements to data models in the interim Integration Definition (IDEF) Repository.

2.2 GOAL 2: Standard Data

Standard data is key to M&S for interoperability of models and simulations and command, control, communications, and intelligence (C4I) systems. Use of standard data within M&S also promotes reuse of resources and credibility of simulation results. M&S will develop data standards to support common representation of data for M&S use and maintain standard data elements and data models in distributed repositories that enable data sharing, reuse, and single point-of-entry. Standard data representation aids in M&S resource development, operations and maintenance, and facilitates integration of DoD M&S resources with the DoD Enterprise Models.

Standardization of all existing models and simulations and data production sources may not be practical or even possible in the near term. To support these M&S users, the M&S FDAd will support development of data interchange formats (DIFs) for use in mapping data between sources and users. The DIFs will allow data interchange while the data standardization process continues.

2.2.1   Objectives

2.2.1.1   Develop Standard Data Elements

The M&S community is dependent upon the rest of the DoD DA community for the majority of its data standards and does not standardize most of its data elements independently. This is because the M&S community is primarily a user of data defined and often produced by other Functional areas and DoD Components. The M&S community uses international, national, Federal, and DoD standards. The M&S FDAd coordinates and guides the assembly, review, and submittal to the DoD DAd of those data model proposal packages that originate in the M&S community. In addition, the M&S FDAd reviews functional data model proposal packages received from the DoD DAd for distribution to selected reviewers in the M&S community.

Actions:

- Develop, implement, and continually improve the M&S data standardization process (integrated with the DoD standardization process). (Continuing)

- Develop a process for packaging and submitting M&S data models and functional data model proposal packages to DoD. Formulate and distribute the M&S DA Procedures Manual to describe the process for M&S data element standardization, registration, and maintenance of M&S data on the DoDR and MSRR. (FY96)

- Coordinate functional and technical reviews of proposal packages by appropriate M&S personnel and other FDAds and Component Data Administrators (CDAds). (Continuing)

2.2.1.2   Perform Data Modeling

The M&S community uses the evolving DoD process and data models as a framework to facilitate interoperability and reuse. The DoD Enterprise Process and Data Models provide a common perspective to support cross-functional integration and to control data redundancy. M&S will integrate its data models with the DDM.

Actions:

- Develop, coordinate, and submit M&S data models (e.g., National Air Intelligence Center (NAIC) aircraft kinematics data model, Close Combat Tactical Trainer (CCTT) Electronic Combat Database (ECDB) data model, Joint Tactical Combat Trainer System (JTCTS) Electronic Warfare (EW) source database data model) to DoD DA for integration with the DDM. (FY96)

- Develop, coordinate, and submit additional M&S data to DoD DA for integration with the DDM. (Continuing)

- Coordinate development of M&S data modeling requirements with the command, control, and communications (C3) and Intelligence FDAds. (Continuing)

2.2.1.3   Incorporate External Standards

The M&S community is basing much of the design of their models and simulation on object oriented techniques. This necessitates new techniques for using the data from relational database(s) within those models and simulations. In addition, the M&S community deals with technical and scientific data that is often represented as complex data rather than atomic data. Complex data is difficult to model, standardize, and to share because it may consist of compound structures of interrelated atomic facts or be highly derived. The M&S FDAd coordinates ongoing external efforts to develop data models and standards for object oriented techniques, complex data, and other technically emerging areas and promotes these data standardization techniques/procedures to the DoD DA community.

Actions:

- Perform pilot studies with Integration Definition for Information Modeling (version 1995) (IDEF1X$_{95}$) for M&S complex data representation and object oriented modeling techniques.

- Develop extensions to DoD data standards to handle symbology, icons, nomenclature, and incorporate into DoDD 8320.1.

- Develop extensions to DoD data standards based on emerging data technologies and provide proposed changes to DoD. (Continuing)

2.2.1.4   Develop Shared Database(s)

In the M&S Master Plan (MSMP), the M&S FDAd has identified C4I, Natural Environment, Systems, and Human Behavioral representations as the primary subject areas for which to standardize data. These areas support such critical projects as Joint Simulation System (JSIMS), Joint Warfare System (JWARS), and Synthetic Theater of War 1997 (STOW-97).

2.2.1.4.1   Provide timely and authoritative representations of the natural environment (e.g., terrain, oceans, atmosphere, and space)

Interoperable simulations depend upon authoritative representations of the natural environment including natural phenomenology and permanent and semi-permanent man-made features. This requires consistent and scaleable three-dimensional representations of the terrain, oceans, atmosphere, and space.

Actions: For each area of natural environment representations, the following apply:

- Develop data models and standard data elements. (All but Space, FY96-97; Space, FY97)

- Make representations available to the M&S community through the MSRR. (Continuing)

2.2.1.4.2   Provide authoritative representations of systems

Systems include major platforms, weapons, sensors, units, life support systems, C4I systems, and logistics support systems. Authoritative representations of systems require models of systems and their associated parameters, which together provide verified and validated performance levels across a variety of conditions.

Actions:

- Understand how to map objects and object classes representing systems to the respective data models and data elements. (FY96)

- Make system representations available to the M&S community through MSRR. (Continuing)

2.2.1.4.3 Provide authoritative representations of human behavior and behavior of groups and organizations

Authoritative representations of individual human behavior and behavior of groups and organizations require that verified and validated metadata and instance data be available for use in models and simulations.

Action:

- Make human representations data available to the M&S community through the MSRR. (Continuing)

2.2.1.5 Perform Data Mapping and Migration

Many databases used to support M&S are not viable candidates for data standardization. Additionally, there are a multitude of models and simulations in use today for which data standardization is not practical. A set of DIFs will be identified and/or developed to allow data interchange between these and other M&S users. These DIFs will permit data mapping from source to M&S user.

Actions:

- Identify existing DIFs and support data modeling and standardization (e.g. Synthetic Environment Data Representation and Interchange Specification (SEDRIS), next-generation Distributed Interactive Simulation (DIS++). (FY96-FY97)

- Develop DIFs for prioritized programs (e.g. Conceptual Models of the Mission Space (CMMS), High Level Architecture (HLA) Object Model Template (OMT)). (FY96)

- Develop DIF for simulation services to C2 using the Command and Control Simulation Interchange Language (CCSIL) for the Modular Reconfigurable C4I Interface (MRCI)). (FY96-FY97)

- Identify critical areas where other DIFs are needed. (Continuing)

2.2.1.6 Support Migration Systems

The M&S community has an ongoing requirement to interface with the C4I community. The use of M&S to support near-real-time decision making for campaign planning, force deployment, and contingency planning necessitates interoperability between M&S and warfighting databases. In addition, interfacing M&S with C4I allows the warfighter to receive quality, realistic training while using go-to-war systems. The M&S community is committed to developing DIFs to support these requirement as described in **2.2.1.5**.

2.2.1.7 Support New Start (Target) Systems

The M&S community is committed to developing the M&S technical infrastructure as described in the MSMP. Keys to this infrastructure are the HLA and CMMS. The M&S FDAd will develop DIFs to support these requirements as listed in **2.2.1.5** above.

2.2.1.8   Support Business Process Reengineering (BPR)

The M&S community consists of diverse DoD and non-DoD organizations who develop and use models and simulations and, therefore, share the associated resources. As such, formal process improvement activities do not strictly apply to the M&S community. However, The M&S FDAd is sensitive to opportunities to apply information technology and data administration practices for process reengineering and improvement.

Action:

- Identify BPR opportunities as necessary. (Continuing)

2.2.2   Milestones

OBJECTIVES	REFERENCE #	ACTIONS	PROJECTED START/ COMPLETION DATES
Develop standard data elements	2.2.1.1	1) Improve M&S Data Standardization Process 2) Formulate/distribute M&S DA Procedures Manual for standardizing data elements and submitting data model proposal packages 3) Review data packages from DoD	1) Continuing 2) FY96 3) Continuing
Perform data modeling	2.2.1.2	1) Prepare data model submission packages 2) Coordinate activities with C3 and Intel FDAds	1) Continuing 2) Continuing
Incorporate external standards	2.2.1.3	1) Develop IDEF1X$_{95}$ for complex data and Object Modeling techniques 2) Develop extensions to DoD data standards for Symbology, Icons, and Nomenclature 3) Develop extension to IDEF1X for emerging data technologies	1) FY96-FY97 2) FY97 3) Continuing
Develop shared databases	2.2.1.4	1) Develop data models and data standards of natural environment 2) Natural environmental representations available in MSRR 3) Map between objects and data models 4) System representations available in MSRR 5) Behavioral representations available in MSRR	1) FY96 (Space by FY97) 2) Continuing 3) FY96 4) Continuing 5) Continuing
Perform data mapping and migration	2.2.1.5	1) Id existing DIFs - support data modeling 2) Develop DIFs for prioritized programs 3) ID critical areas where additional DIFs needed	1) FY96 2) FY96-FY97 3) Continuing
Support migration systems	2.2.1.6	Develop DIFs	Ongoing
Support new start (Target) systems	2.2.1.7	Develop DIFs	Ongoing
Support BPR	2.2.1.8	ID BPR opportunities	Continuing

2.2.3   Lessons Learned

Recent advancements in M&S have led to the absolute necessity for easy interchange of information between the M&S and C4I communities. The use of DIFs will permit exchange of data/information between standard/non-standard systems allowing these communities to work closely together.

2.3 GOAL 3: Use of Common Procedures and Tools

M&S employs and promotes the use of common procedures and tools to support the M&S FDAd, study directors, data administrators, and the functional and technology support community. These procedures and tools provide shared access to standard data products (e.g., process and data models, complex data representations, and data element definitions). They also support reusability and interoperability of associated M&S resources (e.g., metadata, data, algorithms, models, simulations, and tools) among developers and users throughout the M&S community.

2.3.1   Objectives

2.3.1.1   Implement methodologies and Techniques

The M&S FDAd is developing and implementing methodologies and techniques to improve the overall DA program throughout the M&S community. This includes a methodology for reverse engineering databases and models and simulations to develop data models, map the legacy systems to the DoD standard, and propose candidate data elements to DoD for standardization.

Actions:

- Use the Reverse Engineering for Data Integration and Sharing Methodology for reverse engineering, modeling, and standardization of data elements contained in legacy systems. (Continuing)

2.3.1.2   Develop tools to enhance productivity for the M&S community

The M&S FDAd evaluates and implements tools to support the M&S DA Program in the M&S community. The M&S FDAd is developing and implementing products designed to improve data usefulness throughout the M&S community. This includes: tools on the MSRR to locate, access, and automatically retrieve data from ADSs; a Data Quality Engineering (DQE) tool to allow quality checking of databases; and, tools/procedures to determine and list data quality profiles for the ADS databases.

Actions:

- Develop tools/procedures to allow users to easily identify, access, order, and automatically retrieve ADS databases on the MSRR. (FY96-97)

- Make the U. S. Central Command (CENTCOM) DQE tool portable across multiple platforms and database management systems and provide to the DoD DA community. (FY96-97)

- Develop tools to describe database data quality and provide quality profiles. (FY96)

2.3.1.3   Perform Technology Transition

M&S drives the development or is a prime candidate for exploiting new technologies (e.g., self describing messages, self describing applications, highly advanced software applications). The

M&S FDAd will investigate and leverage these technologies as they emerge to ensure the DA community keeps in step.

Action:

- Investigate object oriented techniques and other emerging technologies for extensibility into IDEF1X methodology/procedures. (Continuing)

2.3.2   Milestones

OBJECTIVES	REFERENCE #	ACTIONS	PROJECTED START/ COMPLETION DATES
Implement methodologies and techniques	2.3.1.1	Use Reverse Engineering for Data Integration & Sharing Methodology	Continuing
Develop tools	2.3.1.2	1) Develop tools to ID, access, retrieve ADS information 2) Portable DQE tool 3) Tools to describe database quality	1) FY96-FY97 2) FY96-FY97 3) FY96
Perform technology transition	2.3.1.3	Investigate OO techniques	Continuing

2.3.3   Lessons Learned

The Reverse Engineering for Data Integration and Sharing Methodology has been successfully applied across a wide variety of datasets. Its dissemination and use throughout DoD should be a high priority in the overall DoD DA program. Tools to rapidly acquire datasets and check them for accuracy and quality are a high priority in the M&S community. These tools will significantly enhance the credibility of M&S results.

2.4 GOAL 4: Quality Data and Data Security

Verification, validation, and accreditation (VV&A) of models and simulations, and VV&C of data are essential for gaining the confidence of user organizations that M&S outcomes are representative of the real world, that they are reasonably correct, and that the models and simulations are acceptable for a specific purpose. The M&S community will perform VV&A during development of models and simulations and as part of life-cycle management. The M&S FDAd will develop methodologies, standards, and procedures for the VV&C of data. The M&S FDAd will provide tools to record VV&A/VV&C activities and results and make histories available to the M&S community through the MSRR.

Data security is critical to M&S because of the need to run large exercises using distributed simulations over networks. Also the requirement to make data for initializing and executing simulations available on-line from the MSRR, requires understanding of security issues and methods for handling both sensitive unclassified and classified information. Conflicting security policies and procedures and changing requirements and technologies are forcing DoD to take a critical look at data security.

2.4.1 Objectives

2.4.1.1 Assure Data Quality

The data M&S FDAd has two projects addressing data quality: VV&C guidelines and ADS. The VV&C guidelines project is defining the VV&C process as an integral part of the M&S VV&A process and has developed VV&C definitions which are included in the Draft DoD Instruction to DoDD 5000.59 on VV&A. It will develop VV&C guidelines for DIS user data, non-DIS user data, and producer data including VV&C techniques, procedures, and use of the data quality profile for describing M&S data. It will publish a document recommending policy and assigning responsibilities for VV&C of data, establishing VV&C guidelines and procedures for M&S applications, and defining a data quality profile for describing data quality. It is working closely with the Defense Information Systems Agency (DISA) Center for Computer Systems Engineering (CFCSE) to coordinate these efforts and institutionalize the concept of the data quality profile, describe the condition of a certified database, and support a data audit trail.

The ADS project has developed definitions, identified data categories and criteria, and defined responsibilities for authoritative data sources and users. It produced an initial joint M&S taxonomy directory for data sources, a directory for authoritative data sources, and a document of responsibilities that can become the foundation for a policy document. It will identify Component-approved ADSs and will populate this information on the MSRR including descriptions, points-of-contact, and data ordering and retrieval information.

Actions:

- Establish nominative procedures for data VV&C, develop metrics for measuring data quality, and issue procedure guide. (FY96)

- Perform VV&C pilot studies to verify/refine nominative procedures. (FY96-97)

- Make histories of VV&C activities and results available on the MSRR. (FY96-97)

- Identify Component-approved ADS and populate the MSRR with source identification, location, and description. (FY96-97)

2.4.1.2 Assure Data Security

The M&S FDAd is sponsoring a project to define data security requirements for the M&S community so that policies, procedures, standards, and tools can be adapted for managing classified and non-classified data more effectively. The M&S FDAd has published a white paper listing nine issues (Reference 8):

(1) Data exchange

(2) Data access

(3) Data aggregation affecting change in security classification

(4) Classification of subset of enumerated values (e.g., unclassified data element has smaller subset of possible values than classified data element)

    (5)   Protection of data source in downgrading data (affects use of knowledge based aids for determining the confidence, etc., of downgraded data)

    (6)   Access to classified data by user via classified data center: releasability issue that prevents use based on need-to-know, need to assure data will be used properly, etc.

    (7)   Need for standardized security labels for use in automated systems

    (8)   DIS or distributed simulation confederations with Components interoperating (exchanging data) at different security levels

    (9)   Ability for a Component to participate in exercises at different security levels from the same physical location

The project goals are to: (1) identify the M&S data security requirements; (2) develop a research agenda for those data security requirements not met by current technologies; and (3) facilitate information transfer between the model user and technology transfer communities.

Actions:

- Define data security requirements for the MSRR.(FY96)

- Support collaborative efforts between M&S data centers with security issues and Advanced Research Projects Agency (ARPA) contractors with technology solutions in the ARPA security testbed. (FY96-FY97)

2.4.1.3   Maintain Configuration Management

All M&S data standardization activities are documented on the MSRR. M&S process and data models are maintained and updated as necessary, tools are provided to maintain configuration management and quality assurance, and protection devices are in place to protect the information from intrusion or unauthorized access.

The M&S FDAd is supporting development of DIFs for several important M&S programs. A Protocol Catalog (PC) (for DIS, ALSP, and DIS++) and data dictionaries (DDs) for CMMS, HLA OMTs, SEDRIS, and MRCI/CCSIL will be developed in conjunction with DIF development. Standardization of these dictionaries in accordance with DoDD 8320.1 will be accomplished as they mature and gain acceptance throughout the M&S community. These DDs will be maintained on the MSRR.

Actions:

- Document M&S data standardization activities on the MSRR (Continuing).

- Support development of the PC and SEDRIS, CMMS, HLA OMT, and MRCI/CCSIL DDs and incrementally install on MSRR. (FY96-97)

2.4.2   Milestones

OBJECTIVES	REFERENCE #	ACTIONS	PROJECTED START/ COMPLETION DATES
Assure data quality	2.4.1.1	1) Establish procedures for VV&C 2) Perform VV&C pilot studies 3) VV&C histories available on MSRR 4) ID Component-approved ADS	1) FY96 2) FY96-FY97 3) FY96-FY97 4) FY96-FY97
Assure data security	2.4.1.2	1) Define security requirements for MSRR 2) Support security efforts of ARPA	1) FY96 2) FY96-FY97
Maintain configuration management	2.4.1.3	1) Document standardization activities on MSRR 2) Support PC and SEDRIS, CMMS, HLA-OMT, MRCI/CCSIL DDs	1) Continuing 2) FY96-FY97

2.4.3   Lessons Learned

Since data security and data quality issues affect all of DoD, it is imperative that representatives from DoD functional and Component levels, Federally Funded Research and Development Centers (FFRDCs), and contractors participate in requirements definition, issue identification, and recommendations for development in data security and VV&C.

2.5 GOAL 5: Education, Training, and Consultation Services

Data administration training, education, consultation are available to a broad spectrum of practitioners within the DoD and the DoD support community. The Electronic Proving Ground (EPG) Joint DataBase Elements (JDBE) project has been providing training in a reverse engineering methodology for data standardization of legacy systems since 1992. This training, funded by DMSO, is available to M&S organizations undertaking data standardization projects.

2.5.1   Objectives

2.5.1.1   Train Personnel

The M&S FDAd will provide data administration training to M&S personnel to promote user awareness and sharing of information across the M&S community. Agendas of meetings, directories of M&S systems and databases, resource materials, white papers, bulletin boards, etc., will be made available to users of M&S Information System (MSIS) and MSRR on the World Wide Web (WWW). The M&S FDAd will identify a set of core education and training requirements for M&S FDAd functional and technical staff and schedule the staff for DoD DA training, professional organization training, seminars, conferences, workshops, and symposia.

Actions:

- Promote user awareness and sharing of information across the M&S, DoD, academia, and contractor communities. (Ongoing)

- Identify training requirements. (Ongoing)

- Provide training to interested data administration personnel and schedule them in the M&S DA master schedule. (Continuing)

- Develop and implement training plan. (Ongoing)

2.5.1.2   Develop Courses

The M&S FDAd has participated in the development of a course in reverse engineering methodology and its application to the IDEF1X and DoD data standardization process. This training is conducted by the EPG/JDBE project at its headquarters in Ft. Huachuca or on the road. The training has been given to over 200 data administration personnel since 1992.

Action:

- Update and advertise the reverse engineering course at JDBE. (Continuing)

2.5.1.3   Provide Data Administration Consultation

The M&S FDAd will provide consulting services to the M&S community in the areas of training, data modeling, reviewing functional data model proposal packages and submitting them to the DoD DAd for approval, facilitating database development and implementation, and operating the MSRR.

Action:

- Provide consultation services and schedule them in the M&S DA master schedule. (Ongoing)

2.5.2   Milestones

OBJECTIVES	REFERENCE #	ACTIONS	PROJECTED START/ COMPLETION DATES
Train personnel	2.5.1.1	1) Promote user awareness and sharing of information 2) Identify training requirements 3) Provide training to 4) Develop/implement training plan	1) Ongoing 2) Ongoing 3) Ongoing 4) Ongoing
Develop courses	2.5.1.2	Upgrade reverse engineering course	Ongoing
Provide data administration consultation	2.5.1.3	Provide consultation services and schedule them in the M&S DA master schedule	Ongoing

2.5.3   Lessons Learned

Providing an electronic forum to educate and keep the geographically widespread M&S community informed is essential to achieving the DoD M&S Master Plan objectives and DA goals. DMSO supports the MSIS, the MSRR, and several nodes on the WWW to provide this electronic forum for the M&S community. JDBE training has been especially successful because it occurs in an actual project setting. This assures that the application of the training to the 'real-world' is well understood.

2.6 GOAL 6: Effective Infrastructure

A M&S DA infrastructure is in place to support the MSMP objectives in accordance with DoD DA Directives. M&S DA policy and procedures will be developed and promulgated to guide M&S data standardization efforts. The M&S FDAd will implement the process and continually monitor its progress to improve it. The M&S FDAd will provide essential leadership to effect improved data management.

2.6.1   Objectives

2.6.1.1   Implement Policy and Procedures

The M&S FDAd will develop and deliver policy and procedures for the M&S community to direct their efforts within the context of the overall DoD DA Program. The documents include: M&S Data Standardization Procedures to supplement DoDD 5000.59; a data VV&C/data quality manual; and, a reverse engineering methodology manual. These documents will be for use by the entire DoD DA community as well as the organizations/projects supporting the M&S FDAd. M&S DA procedures and standards for scientific and technical data will be shared with DISA for inclusion in DoDD 8320.1 data modeling and standardization policy and procedures.

Actions:

- Promulgate Instruction on M&S DA policy and procedures as a supplement to DoDD 5000.59. (FY96)

- Provide Manual on Reverse Engineering for Data Integration and Sharing Methodology to DISA for promulgation as a supplement to DoD 8320.1-M. (FY96)

- Draft a Manual on Data Quality Methodology for DISA promulgation as a supplement to DoD 8320.1-M. (FY97)

2.6.1.2   Establish Performance Metrics

The M&S FDAd will establish metrics for evaluating the accomplishment of approved action plans in the M&S DASP. This will provide project management oversight of MSMP and DASP Action Plans, track resources, and measure successful achievements by action plan for each year.

Action:

- Establish metrics for evaluating the performance of DA program. (Continuing)

2.6.1.3   Perform Coordination

The M&S FDAd establishes and maintains liaisons with all other FDAds, Component M&S offices, CDAds, and data stewards. These collaborative working relationships help to standardize data required for M&S applications, streamline and facilitate collection, dissemination, and use of authoritative data, and develop and implement enabling technologies (e.g., information repositories, databases, and tools). Priority areas for improving ADSs will be in C3I, the natural environment, systems, and human behavior representations.

Establish and coordinate activities with the M&S Functional Working Groups (FWGs) and Technology Working Groups (TWGs) to support M&S DA activities, improve M&S DA processes, identify requirements for data sharing in functional and technology areas, address data technology, security, and quality issues, and oversee development, integration, and use of M&S data models and data representations.

Actions:.

- Maintain a master schedule for M&S DA activities. (Ongoing)

- Conduct M&S coordination meetings as required. (Continuing)

2.6.1.4   Perform Promotional and Information Dissemination Activities

The M&S functional area is acquiring repositories and tools and using them to support data standardization, data quality, reuse, data migration, and interoperability. The M&S FDAd provides easy WWW access to all M&S DA activities through the MSRR. Information on content/schedules of the program/projects, on-going activities, and up-coming events are posted for the entire DA community.

The M&S FDAd also provides direct support to M&S practitioners via the Modeling and Simulation Operational Support Activity (MSOSA). This organization provides help desk support in the areas of identification of models and simulations, data sources, and other M&S resources, schedule of upcoming events, on-line technical support, resource availability, and tools for access and retrieval of information and resources.

The M&S FDAd attends DA meetings, planning and information exchange conferences, and symposia of the following groups: the Data Administration Council (DAC); the DoDR SC; C3I Stakeholders; Institute of Electrical and Electronics Engineers, Inc. (IEEE), IDEF1X and Metadata Working Groups; Intelligence Community Standards Panel; Military Operations Research Society (MORS); and Armed Forces Communications Electronics Association (AFCEA).

Action: See Section 2.6.1.3

2.6.2 Milestones

OBJECTIVES	REFERENCE #	ACTIONS	PROJECTED START/ COMPLETION DATES
Implement policy and procedures	2.6.1.1	1) Promulgate M&S DA policy and procedures 2) Promulgate Reverse Engineering for Data Integration and Sharing Methodology Manual 3) Promulgate instruction on VV&C	1) FY96 2) FY96 3) FY97
Establish performance metrics	2.6.1.2	Establish metrics for DA program	Continuing
Perform coordination	2.6.1.3	1) Maintain master schedule 2) Conduct coordination meetings	1) Ongoing 2) Continuing
Perform promotional and information dissemination activities	2.6.1.4	1) Maintain master schedule 2) Conduct coordination meetings	1) Ongoing 2) Continuing

2.6.3 Lessons Learned

Establishing an effective M&S DA infrastructure requires functional, technical, and administrative support and strong senior management support to achieve the DoD Corporate Information Management (CIM) Initiative and DoD MSMP objectives. The MSMP drives the M&S DA program, which is being implemented in accordance with DoD DA Directives. Under the leadership of DDR&E, DMSO, and the chair(s) of the DTWG, the TGs and subgroups define data requirements, identify data issues, and make recommendations for implementation. Since the M&S DA Program receives strong support from all levels of the M&S community actively involved in the FWGs and TWGs, the M&S FDAd is well postured to accomplish the action plans identified in this DASP.

2.7 Resource Requirements

2.7.1 Assumptions and Constraints

In the area of data standardization (Goal 2), it should be noted that the M&S community is primarily the user of data, not the proponent. Resource estimates therefore reflect the fact that the M&S FDAd will work very closely with other functional areas and Components, particularly the C3 FDAd and the Intelligence FDAd, to standardize data.

2.7.2 Procurement Requirements

Procurement requirements impact Goal 3 in that there will be a MSRR tool cost, and DMSO may become a beta-site for the DoDR. In the case of Goal 2, the M&S FDAd will incur a cost for maintaining currency of process and data modeling.

2.7.3   Impact of Unfunded Requirements

The impact of unfunded requirements clearly affects all DoD goals. If requirements are not fully funded, some tasks will not be undertaken or will not meet the schedules shown in the milestone tables for each goal. Specific impacts would depend on the timing and size of any funding shortfalls. Whether a specific task would be stretched out or simply eliminated depends in part on the total amount of funds actually available after cutbacks.

2.7.4   Resource Tables